Supporting Information

Performance of iron-air battery with C-N composites modified iron oxide electrode

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Chemical reagents

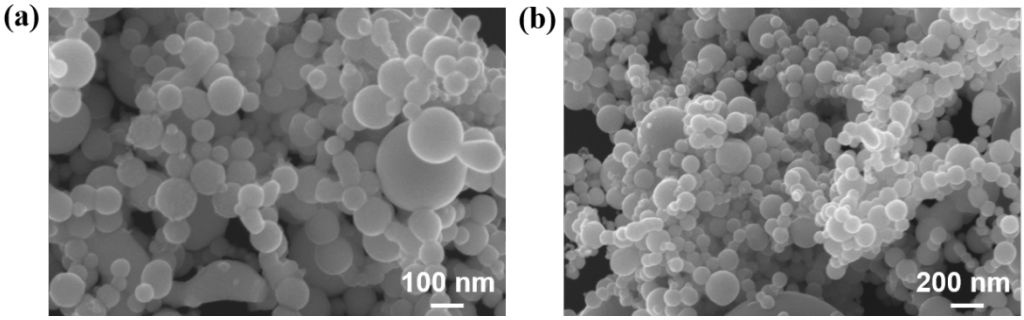

Fig.S1 SEM image of the iron powder (99.9% metals basis, 100 nm).

Synthesis of NanoFe@CN

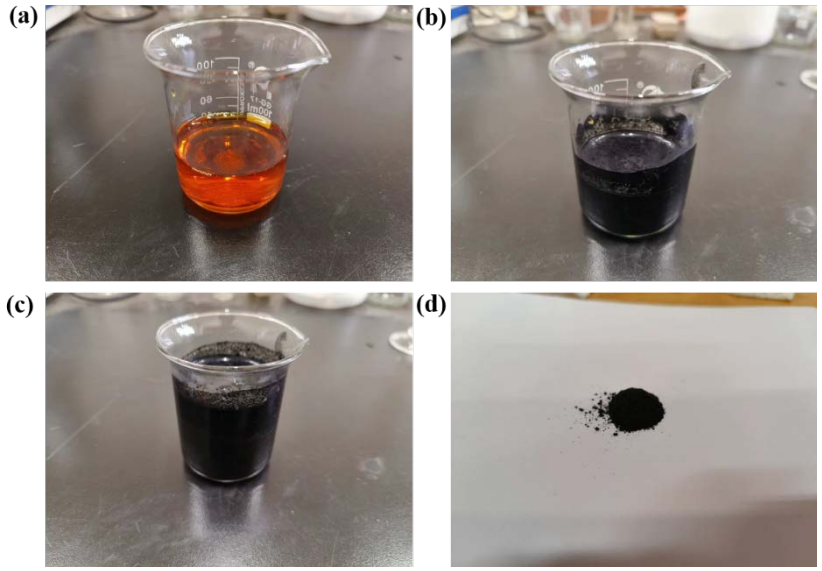

Fig.S2 Synthesis of NanoFe@CN.

(a) 22.0 g of $Fe(NO_3)_3 \cdot 9H_2O$ was were dissolved in 36 mL of ultrapure water, (b) followed by the addition of 3 g of polyaniline and sonication for 30 min. (c) 1 M of NaOH was added dropwise to the solution to adjust the pH of the solution to 5-6. (d) The powder obtained from pyrolysis was NanoFe@CN.

Preparation of IAB

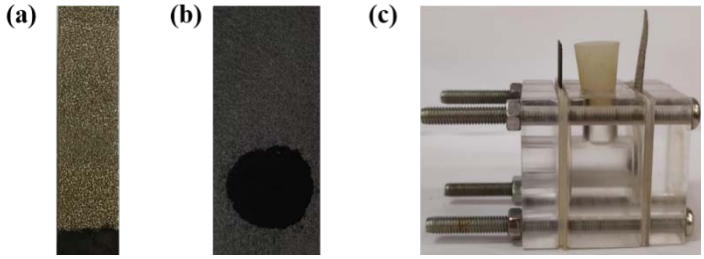

Fig.S3 preparation of IAB.

(a) NanoFe@CN Fe electrode, (b) air electrode and (c) iron-air battery.

Physicochemical Characterization

The morphology, composition and structure of the catalyst were analyzed by Scanning electron microscopy (SEM, thermo scientific Apreo 2 C), Energy-dispersive spectrometry (EDS, super octane) and X-ray power diffraction (XRD, Bruker D8 ADVANCE).

Electrochemical Measurements

The battery performance measurements were carried out on a Program-Controlled Battery Tester (CT-4008–5V50 mA-164, NEWARE, China) in home-made IAB at room temperature (25 ± 2 °C).

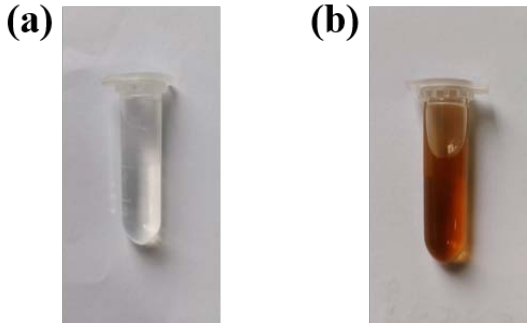

Fig. S4 Color of electrolyte (a) before and (b) after battery test in 6 M KOH electrolyte.

Contents of different elements in catalyst

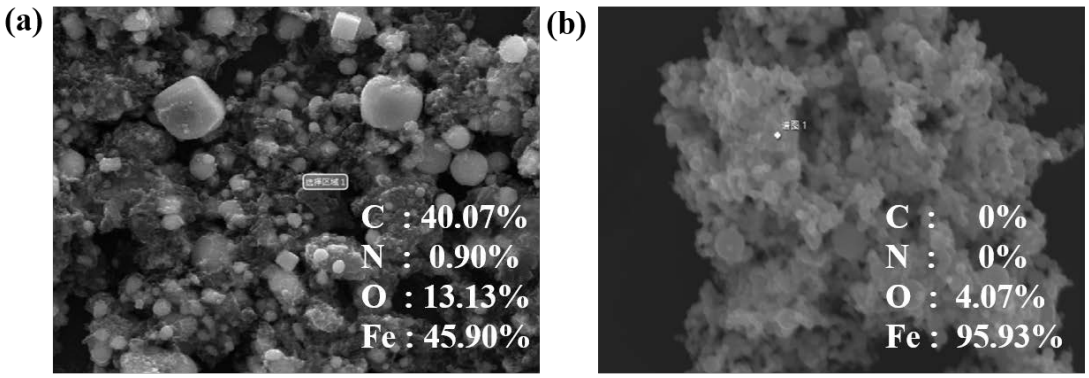

Fig. S5 Contents of different elements in catalyst.
EDS spectrum scan area and elemental content of (a) NanoFe@CN and (b) NanoFe.